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H2E

(71) Applicant
Bunker Ramo
Corporation, 900
Commerce Drive, Oak
Brook, Illinois 60521,
United States of America

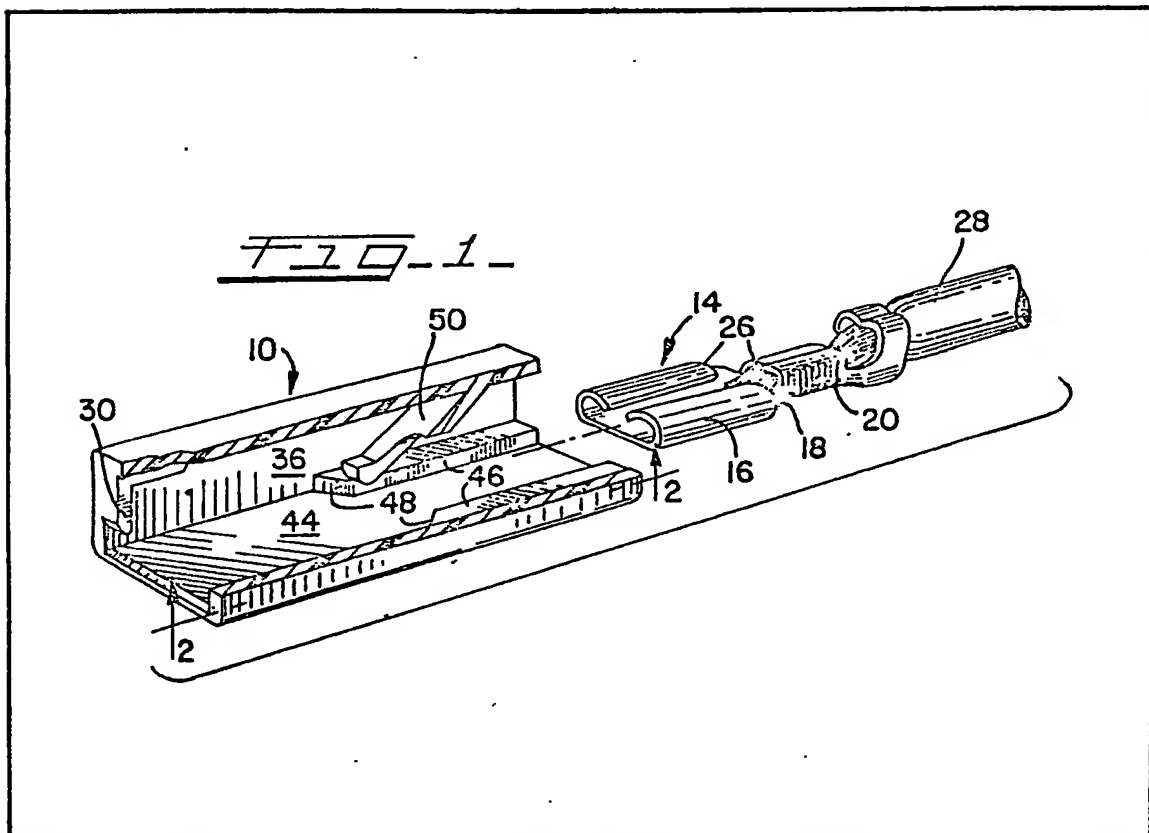
(72) Inventor
Welchlen Chow
(74) Agent
Reddie & Grose

(54) Electrical Connector Housing

(57) A dielectric body with a passageway for accommodating an electrical contact receptacle 14 has:
(1) a forward stop 30 to limit forward movement of the contact;
(2) abutment shoulders 48 spaced from the forward stop to limit rearward movement of the contact; and
(3) a flexible latching means 50 which

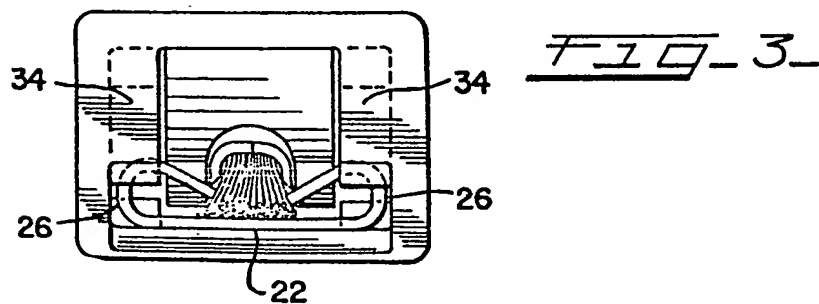
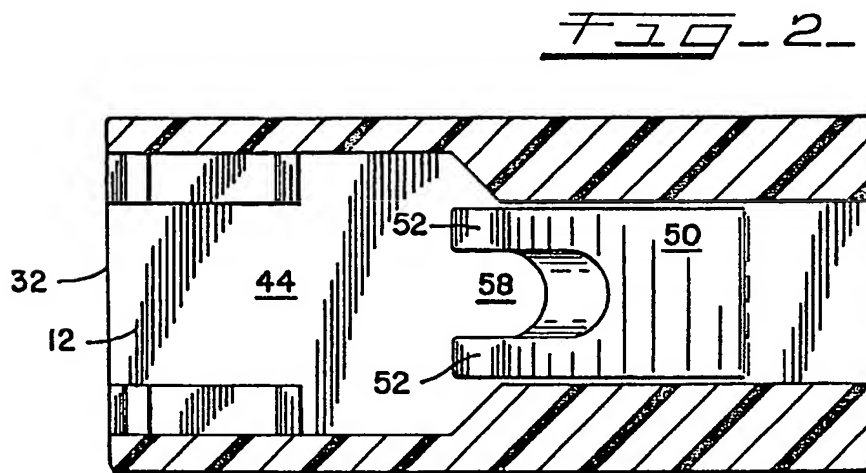
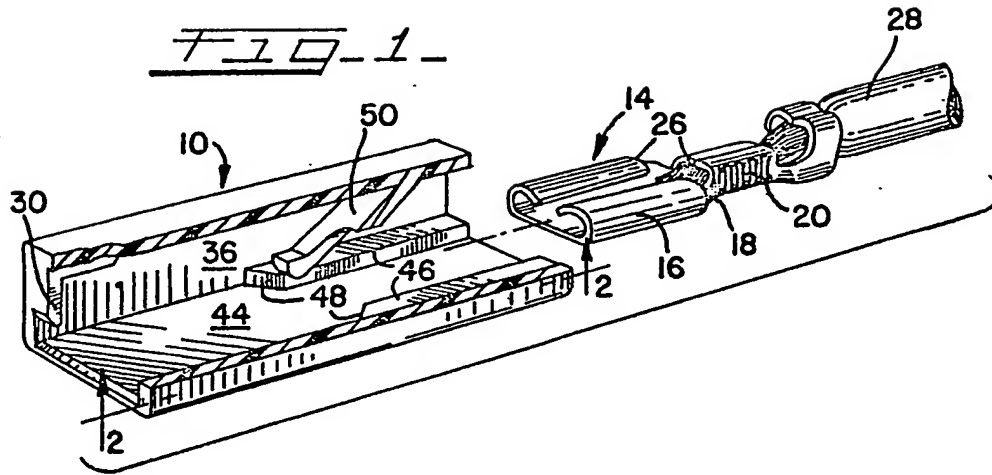
initially moves out of the way as a contact is inserted into the passageway but then engages a rear edge of the engagement section 16 of the contact when the contact reaches its fully inserted position. The flexible latching means 50 is designed to avoid interference with the termination section 18 of the contact and to bias the engagement section 16 of the contact against the bottom 44 of the passageway. The forward stop, the abutment shoulders and the flexible latch co-operate to lock the contact in the housing, the latch means 50 preferably being bifurcated to engage behind respective spring rolls 26 of the contact receptacle 14.

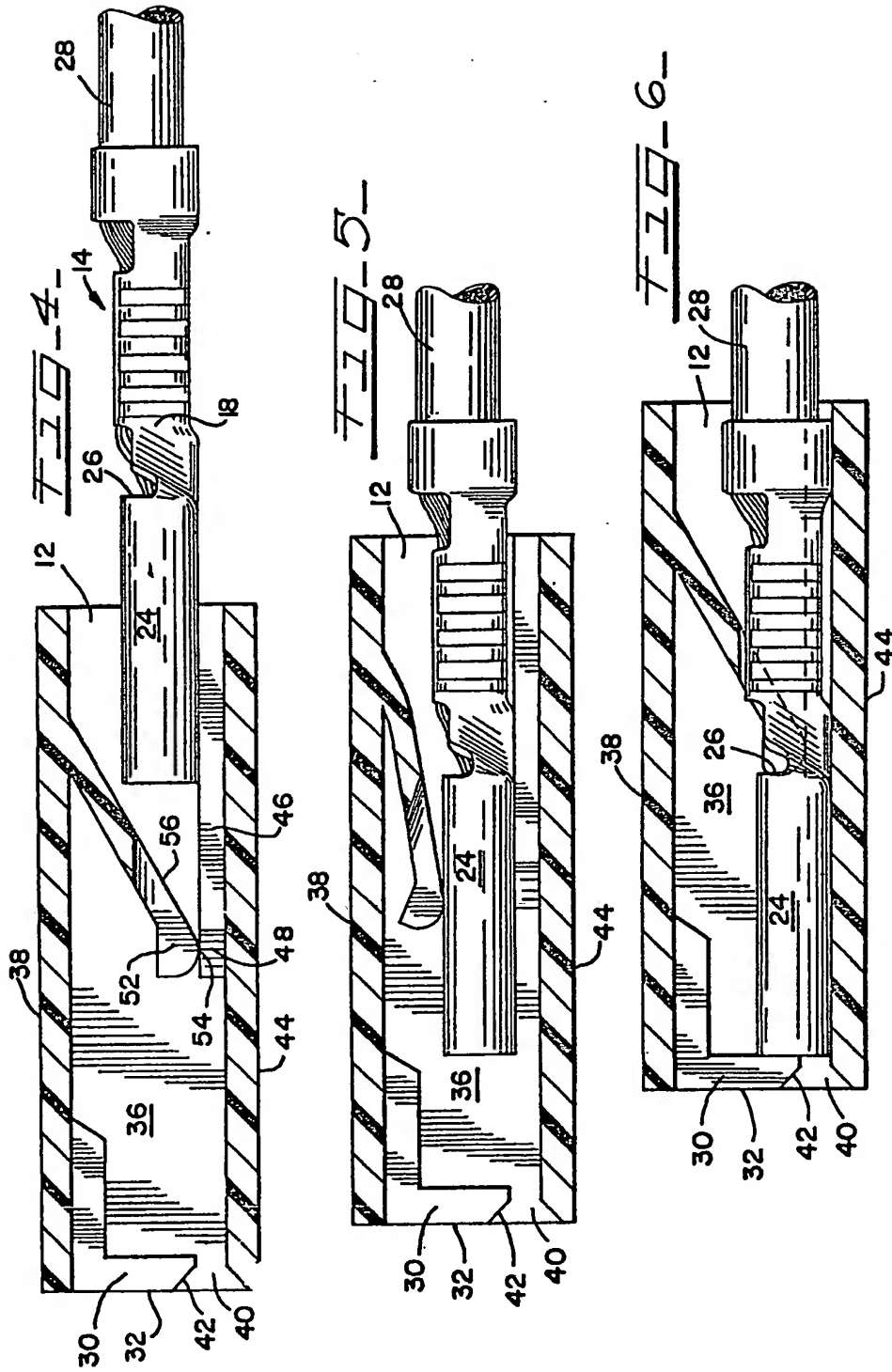
The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.



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SPECIFICATION**Electrical Connector Housing****Technical Field**

The present invention relates generally to electrical connectors and, more particularly, to electrical connectors of the type having a housing adapted to removably mount an electrical contact for mating with a complementary contact. Such electrical connectors generally include one or more passageways into which the contact is inserted and thereafter removably retained by a variety of locking elements.

Background of the Prior Art

In recent years, a great variety of low cost electrical connectors have been developed, particularly for use in home appliances, wherein one-piece molded housings are employed to mount one or more electrical contacts. The connectors must be field serviceable and, therefore, the housings generally include means for releasably locking the contacts in place after termination to an appropriate conductor. Flexible locking or latching means are conventionally utilized to engage a rear portion of the electrical contact after it is fully inserted into the housing. Examples of typical prior art connectors of this sort are disclosed in U.S. Patent Nos. 3,971,613 and 4,013,331.

One significant problem encountered with such prior art connectors is that the latching means are relatively thin and weak in order that they may provide the necessary flexure required during insertion of the electrical contact into the passageway. Thus, a rearward force applied to a "locked" receptacle has the tendency to bend or break the latching means resulting in an undesirable or inadvertent removal of the electrical contact from the housing.

Another difficulty encountered in the prior art derives from the peculiar shape of the electrical receptacles generally employed with low cost connector structures. These receptacles often include a forward engagement section and a rearward terminal section that holds a conductor by one of many well known termination means such as by a crimp termination. The conductor and the terminating means together result in a termination section which may protrude above the top surface of the engagement section to such an extent as to interfere with the contact between the latching means and the engagement section of the electrical contact.

Brief Summary of the Invention

Accordingly, the present invention is directed to a low cost electrical connector which overcomes the disadvantages associated with the prior art discussed above. The connector includes a housing designed to removably retain or secure an electrical contact which is capable of withstanding substantially high tension loads or "pull out" forces applied to the contact via its associated conductor. In addition, the contact

retention means employed is designed to engage the rear edges of the contact without interference from the terminal section of the contact. Finally, each of these functional advantages is attained while minimizing the cost of manufacture, since the connector housing is designed to permit single-action injection molding.

More specifically, the present invention is directed to an electrical connector including a housing having a passageway to accommodate an electrical contact. The passageway is fitted with a forward stop at its forward or mating end, either one or two abutment shoulders and a flexible latching means. The forward stop prevents forward movement of the contact, and the latching means both engage a rear facing portion of the contact to resist rearward forces applied to the contact and exerts a lateral force on the contact to bias it against the bottom surface of the passageway. The abutment shoulders are adapted to engage a rear portion of the engagement section of the contact thereby limiting its rearward movement, and holding the contact in place against the bottom surface of the passageway and in engagement with the abutment shoulders by the biasing force of the latching means. This cooperation between the abutment shoulders and the flexible latching means significantly improves the ability of the electrical connector housing to resist rearward longitudinal forces applied to the electrical contact receptacle.

In a preferred embodiment, the latching means is a bifurcated configuration with two arms adapted to engage either rear edge of the engagement section of the contact while straddling the termination section of the receptacle.

It is therefore an object of the invention to provide an electrical connector in which an electrical contact may be removably secured.

Another object of the invention is to provide an electrical connector housing having a flexible latching means and abutment shoulders which cooperate together to resist rearward forces exerted on an electrical contact mounted in the housing.

Yet another object of the present invention is to provide an electrical connector housing having a bifurcated latching means which contacts either side of rear-facing edges of the engagement section of an electrical receptacle while straddling the termination section of the receptacle.

A further object of the invention is to provide an electrical connector housing having a forward stop positioned at its entrance or mating end to limit forward movement of an electrical contact receptacle placed within the housing as well as a flexible latching means adapted to engage a rear portion of the contact section of an electrical contact receptacle while exerting a downward bias force on the receptacle, and abutment shoulders operating in conjunction with the flexible latching means to engage the rearward

portion of the contact section of the electrical contact receptacle.

Other objects of the present invention will be apparent to those skilled in the art upon a reading of the following detailed description and upon reference to the drawings. While the invention is described below in connection with preferred or illustrative embodiments, these embodiments are not intended to be exhaustive or limiting of the invention. Rather, the invention is intended to cover any alternatives, modifications, and equivalents that may be included within its spirit and scope as defined by the appended claims.

Brief Description of the Drawings

Figure 1 is an exploded, perspective and partially sectioned view of the electrical connector of the present invention including its housing and an electrical contact receptacle which may be secured therein;

Figure 2 is a section view taken along line 2—2 of Figure 1;

Figure 3 is a front elevational view of the electrical connector housing illustrated in Figure 1 with an electrical contact receptacle locked in place therein;

Figure 4 is a section view taken along line 3—3 of Figure 1 showing the electrical contact receptacle about to be positioned within the electrical connector housing; and

Figures 5 and 6 are views similar to Figure 4 showing the electrical contact receptacle first partially inserted within the electrical connector housing and then fully inserted therein.

Detailed Description of the Invention

Turning now to the drawings, an electrical connector housing 10 is illustrated. The housing 10 is molded of resilient dielectric material such as Nylon in one piece and has a passageway 12 of substantially rectangular dimension. The housing 10 is manufactured by conventional molding techniques. Those skilled in the art will recognize that the housing is particularly well suited to economical molding techniques such as straight action, injection molding. An electrical contact receptacle 14 is securable within the housing 10. The electrical contact receptacle 14 comprises a forward engagement section 16 with rearward edges 18 and a rearward termination section 20. The forward engagement section 16 has a base 22 and curved sides folded in to form spring rolls 24 with free edges opposed to the base and disposed on either side of the engagement section 16 and rear edges 26. The rearward termination section 36 is preferably secured to the wire 28 by conventional crimping techniques.

The passageway 12 of the housing 10 has stop means 30 adjacent its forward or mating face 32 and comprising forward stop members 34 integral with the sidewalls 36 and top wall 38 of the housing. The stop means extend downwardly from the top wall 38 in substantially parallel alignment to a medial point along the sidewalls

36, thereby defining an opening 40 between the bottom edges 42 of the forward stop members 34 and the bottom wall 44. The opening 40 accommodates insertion of a complementary electrical contact or tab into the connector housing to engage an electrical contact

receptacle 14 supported within the housing. The members 34 of the forward stop 30 are beveled at their bottom edges 42 to facilitate insertion of the complementary contact.

Disposed rearwardly from the mating face of the housing 10 along the passage way 12 are beveled faces 48 of abutment shoulders 46. The abutment shoulders 46 are located at the intersection or juncture of the sidewalls 36 and the bottom wall 44 and extend from the rear of the passageway to end in the beveled faces 48 which are spaced from the mating face 32 of the passageway. The abutment shoulders 46 are substantially parallel to each other and separated by a distance slightly greater than the width of the engagement section 16 of the contact receptacle 14.

A flexible bifurcated latching means 50 terminating in two spaced arms 52 extends obliquely into the passageway 12 and is directed generally toward the mating face 32 and the bottom wall 44 of the housing 10. In its free standing position, as best illustrated in Figure 4, the forward tips 54 of the arms 52 are spaced from the bottom wall 17 a distance less than the height of the spring rolls 26 of the contact receptacle 14. The latching means 50 is formed integrally with the housing 10 and, because of its configuration and dimension, is resilient and laterally deflectable.

The electrical contact receptacle 14 is securable within the housing 10 in alignment with the opening 40 in the mating face 32 by the combined action of the forward stop 30, the flexible bifurcated latching means 50 and the abutment shoulders 46. As the electrical contact receptacle 14 is inserted into the passageway 12, it comes into contact with the rearward face 56 of the flexible latching means 50 thereby pushing the catch upwardly to enable the contact 14 to proceed further into the passageway 12. When the leading edge of the electrical contact receptacle meets the forward stop 30, the rearward edges 18 of the forward engagement section 16 of the electrical contact receptacle 14 will clear the beveled faces 40 of the abutment shoulders 46 enabling the flexible latching means 50 to bias or urge the base 22 of the electrical contact receptacle 14 against the bottom wall 44 of the housing 10.

The two arms 52 of the latching means 50 are spaced to engage the rearward edge 26 of the spring rolls 24 at this point in order to resist any rearward forces to which the electrical contact receptacle might be exerted. The arms 52 are spaced from each other to define an opening 58 which straddles the terminal section 20 of the electrical contact receptacle 14 thereby avoiding interference between the latching means 50 and

the termination section 20. In addition to engaging the rearward edges 26 of the spring rolls 24, the latching means 50 also biases the base 22 of the engagement section 20 against the bottom 44 of the passageway 12 in order to insure contact between the rear edges 18 of the forward engagement section 16 and the beveled faces 48 of the abutment shoulders 46.

Since the rearward forces to which the electrical receptacle 20 is subjected will be primarily longitudinally directed, the abutment shoulders 46 greatly enhance the ability of the flexible latching means 50 to withstand rearward displacement of the electrical contact receptacle 14 from the housing 10.

Claims

1. An electrical connector housing comprising: a dielectric body having a bottom wall, a top wall and two side walls defining a passageway to accommodate an electrical contact receptacle, said contact receptacle comprising a forward engagement section and a rearward termination section; a forward stop positioned at an entrance to said passageway adjacent to the mating end of said housing to limit forward movement of the contact receptacle; an abutment shoulder on said bottom wall positioned within said passageway at a distance to the rear of the forward stop generally equal to the length of said receptacle forward engagement section, said abutment shoulder also spaced from one side wall a distance generally less than the width of said receptacle forward engagement section and greater than the width of said receptacle rearward termination section, said abutment shoulder limiting rearward movement of said electrical receptacle; and a flexible latching means adapted to be dislodged by said engagement section during insertion of said contact receptacle into said passageway to allow insertion of said contact receptacle into said passageway, said latching means engaging a rear facing edge of said engagement section without interference from said termination section to resist rearward longitudinal movement of said contact receptacle, said latching means further biasing said engagement section longitudinally in the space defined by said forward stop and said abutment

shoulder, said latching means, said abutment shoulder and said forward stop cooperating to lock said contact receptacle in assembled position within said housing.

2. The electrical connector housing as claimed in Claim 1, wherein said flexible latching means is attached at its rearward end to said top wall, said latching means extending obliquely into said passageway and directed generally toward the mating end of said housing, said latching means moving away from said engagement section during insertion of said contact receptacle into said passageway, said latching means being sufficiently resilient to return substantially to its original position as said receptacle section nears said forward stop thereby engaging the rear facing edge of said receptacle section.

3. The electrical connector housing as claimed in Claim 1, wherein the flexible latching means comprises a bifurcated latch with two arms in spaced relationship to each other, said arms being adapted to engage said rear facing edge of said engagement section while straddling said termination section, thereby preventing interference between said flexible latching means and said termination section.

4. The electrical connector housing as claimed in Claim 1, wherein: the engagement section comprises a base with inwardly folded sides forming spring rolls with free edges opposed to said base; said termination section comprises a centrally disposed terminating means adapted to secure an electrical wire; and said latching means engages a rear edge of said spring roll.

5. The electrical connector housing of Claim 1 wherein two abutment shoulders are employed, said abutment shoulders being positioned at opposing intersections of said side walls and said bottom wall, respectively, and at a separation distance generally less than the width of said receptacle forward engagement section and greater than the width of said receptacle rearward termination section, said abutment shoulders being integrally formed with said dielectric housing.

6. The electrical connector housing as claimed in Claim 1, in combination with an electrical contact receptacle having a forward engagement section and a rearward termination section.